

CITY OF PHILADELPHIA
Department of Public Health
Environmental Protection Division
Air Management Services

InterOffice Memo

To: File
From: Biji Pandisseril
Date: September 5, 2012
Subject: Title V Operating Permit Summary for Philadelphia Energy Solutions – Refinery

Company Description:

Philadelphia Energy Solutions – Refinery (formally Sunoco Inc.) owns and operates a petroleum refinery located at 3144 Passyunk Avenue, Philadelphia, PA 19145. The facility's air emissions sources include three (3) boilers larger than 100 MMBTU/hr, heaters, thirty-six (36) process heaters, seven (7) flares, cumene tank truck loading, benzene railcar unloading, propane loading, two Claus sulfur recovery plants, eight (8) cooling towers, storage tanks, marine barge loading, two (2) FCCUs, inter-refinery pipeline equipment, two alkylation units, hydrogen purification, degreasing vats, a butane isomerization unit, wastewater sources, a benzene production unit, a cumene production unit, emergency generators, internal combustion units, and fugitives.

Applicability for Regulations:

The facility is a major stationary source as defined in Title I, Part D of the Clean Air Act Amendments due to the facility's potential to emit Volatile Organic Compounds (VOC), Nitrogen Oxides (NO_x), Particulate Matter less than 10 microns (PM-10), Sulfur Oxides (SO_x), Carbon Monoxide (CO), and Hazardous Air Pollutants (HAPs). The facility is therefore subject to the Title V operating Permit requirements adopted in 25 Pa Code §127, Subchapter G.

The facility has an SO₂ permit that was issued in order for Philadelphia to assure compliance with the NAAQS for SO₂. The facility must maintain specific stack parameters for certain SO₂ sources and must operate the sources in accordance with a previous air dispersion model. These sources also have an SO₂ emission rate.

BOILERS AND HEATER CU115:

The boilers are all applicable to the particulate emissions requirements of 25 Pa Code §123.11 and AMR II, Section V, which is less stringent and has been streamlined from the permit. They are applicable to the CO limits of AMR VIII. They are applicable to the SO₂ limits of 25 Pa Code §123.22, but these are less stringent than the SO₂ permit limits and have been streamlined. They have NO_x limits from the Consent Decree Order 05-CV-2866. They also have conditions that limit PM-10 and three have limits for VOC. These boilers and a heater also have combined rolling 12-month emission limits for all of the above pollutants. Four other boilers are applicable to the NO_x allowance requirements of 25 Pa Code §§123.101-120. Many of the boilers have hourly and/or combined annual heat input caps from permit conditions. Four boilers have NO_x CEMs from permit conditions. Four other boilers have NO_x CEMs from the NO_x allowance requirements.

The permit indicates that streamlining has been done for numerous pollutants having multiple emission limits. The following is a side-by-side comparison of the streamlined limits in the table in Section D.2.(a)(2).

Notation a: For Particulate and SO₂ – RACT shall be compliance with 25 Pa Code 123.11 and 123.22 respectively. These limits are elaborated on through notations c, d and e for Particulate and notations b and f for SO₂.

Notation b: For SO₂: Cited is the SO₂ operating permit, Subsumed is 25 Pa Code 123.22.

For CU018, CU019, CU020, CU021 -

SO2 limit = 0.53 lb/MMBTU – SO2 Operating Permit

SO2 limit = 0.33 lb/MMBTU rolling 365 day average – SO2 Operating Permit

SO2 limit = 0.6 lb/MMBTU – 25 Pa Code 123.22(e)(1) for combustion units greater than or equal to 250 MMBTU/hr, also noted in RACT

Since 0.53 and 0.33 rolling 365 day average is more stringent than 0.6 lb/MMBTU, the 0.53 lb/MMBTU limit and the 0.33 lb/MMBTU rolling 365 day limit is placed in the permit and the 0.6 lb/MMBTU limit is subsumed.

Notation c: For Particulate: Cited is 25 Pa Code 123.11, Subsumed is AMR II, Sec. V.

For CU018, CU020 –

Particulate limit = 0.11 based on $3.6 \times (495)^{-.56} = 0.11 \text{ lb/MMBTU}$ – 25 Pa Code 123.11(a)(2) for combustion units greater than 50 but less than 600 MMBTU/hr, also noted in RACT

Particulate limit = 0.20 lb/MMBTU – AMR II, Sec. V.1.

Since 0.11 is more stringent than 0.20 lb/MMBTU, the 0.11 lb/MMBTU limit is placed in the permit and the 0.2 lb/MMBTU limit is subsumed.

For CU021 –

Particulate limit = 0.1 lb/MMBTU - 25 Pa Code 123.11(a)(3) for combustion units greater than or equal to 600 MMBTU/hr, also noted in RACT

Particulate limit = 0.20 lb/MMBTU – AMR II, Sec. V.1.

Since 0.1 is more stringent than 0.20 lb/MMBTU, the 0.1 lb/MMBTU limit is placed in the permit and the 0.2 lb/MMBTU limit is subsumed.

Notation d: For Particulate: Cited is Permit 94329 dated 12/27/94, Subsumed is AMR II, Sec. V and 25 Pa Code 123.11

For CU018, CU020, CU021 –

SO2 limit = 0.53 lb/MMBTU – SO2 Operating Permit

SO2 limit = 0.33 lb/MMBTU rolling 365 day average – SO2 Operating Permit

SO2 limit = 0.6 lb/MMBTU – 25 Pa Code 123.22(e)(1) for combustion units greater than or equal to 250 MMBTU/hr, also noted in RACT

SO2 limit = 250 ppm –annual average – Permit 98001 and AMS letter dated 3/18/98, using $PV=nRT$ 250 ppm = $4.15 \times 10^{-5} \text{ lb/dscf}$

$4.15 \times 10^{-5} \text{ lb/dscf} \times 9,190 \text{ dscf/MMBTU}$ – oil = 0.38 lb/MMBTU

$4.15 \times 10^{-5} \text{ lb/dscf} \times 8710 \text{ dscf/MMBTU}$ – oil = 0.36 lb/MMBTU

F Factor from 40 CFR 60, App. A, Meth. 19, Table 19-1 (ratio of combustion gas volumes to heat inputs),

for oil = 9,190 dscf/MMBTU

for Natural Gas = 8710 dscf/MMBTU

SO2 limit = 310 ppm –monthly average – Permit 98001 and AMS letter dated 3/18/98, using $PV=nRT$ 310 ppm = $5.15 \times 10^{-5} \text{ lb/dscf}$

$5.15 \times 10^{-5} \text{ lb/dscf} \times 9,190 \text{ dscf/MMBTU}$ – oil = 0.47 lb/MMBTU

$5.15 \times 10^{-5} \text{ lb/dscf} \times 8710 \text{ dscf/MMBTU}$ – oil = 0.45 lb/MMBTU

Since 0.53 lb/MMBTU and (0.33 rolling 365 day average) is more stringent than 0.6 lb/MMBTU and (0.38 or 0.36 annual average) and (0.47 lb/MMBTU or 0.45 monthly limit), the 0.53 lb/MMBTU limit and the 0.33 lb/MMBTU rolling 365 day limit is placed in the permit and the 0.6 lb/MMBTU limit and 0.38 or 0.36 annual average limit and 0.47 or 0.45 monthly limit is subsumed.

The following is a side-by-side comparison of the streamlined limits in the table in Section D.3.(a)(2).

Notation b: For SO2: Cited is the SO2 operating permit, Subsumed is 25 Pa Code 123.22.

For all sources -

SO2 limit = 0.53 lb/MMBTU – SO2 Operating Permit

SO2 limit = 0.33 lb/MMBTU rolling 365 day average – SO2 Operating Permit

SO2 limit = 1.0 lb/MMBTU - 25 Pa Code 123.22(e)(1) for combustion units less than 250 MMBTU/hr and - 0.6 lb/MMBTU – 25 Pa Code 123.22(e)(1) for combustion units greater than or equal to 250 MMBTU/hr

Since 0.53 and 0.33 rolling 365 day average is more stringent than 0.6 lb/MMBTU and 1.0 MMBTU/hr, the 0.53 lb/MMBTU limit and the 0.33 lb/MMBTU rolling 365 day limit is placed in the permit and the 1.0 and 0.6 lb/MMBTU limits are subsumed.

Notations c and d: For Particulate – Cited is 25 Pa Code 123.11, Subsumed is AMR II, Sec. V.

For combustion units greater than 50 but less than 600 MMBTU/hr - Particulate limit based on $3.6 * (\text{capacity})^{-.56}$ – 25 Pa Code 123.11(a)(2)

Particulate limit = 0.20 lb/MMBTU – AMR II, Sec. V.1. units installed before 1970

Particulate limit = 0.10 lb/MMBTU – AMR II, Sec. V.2. units installed after 1970

PROCESS HEATERS:

Each heater is subject to fuel gas H2S limit of Subpart J which are monitor using CEMs at the fuel gas mix drums. Each heater is only allowed to burn Refinery Fuel Gas. The heaters are all applicable to the particulate emission limits of 25 Pa Code §123.11 and AMR II, Section V. For some the state requirement is more restrictive, for others AMR II. Many have NOx limits from the RACT Plan Approval. All have SO2 limits from the SO2 permit. These are more stringent than 25 Pa Code §123.22, which has been streamlined. Three heaters are applicable to the NOx allowance requirements of 25 Pa Code §§123.101-120. Many heaters have heat input caps and annual adjustment or tuneup requirements from case-by-case RACT. One heater has a low-NOx burner requirement from case-by-case RACT. NOx emission limits from RACT are monitored by quarterly stack sampling with a portable analyzer. Hydrogen Plant 861 Heaters 3H1S and 3H1N have been shut down but have been listed in the permit due to having NOx allowance requirements and RACT heat input limitations.

FLARE:

The flares are applicable to the SOx emission limits of AMR III, Section II.B. The fuel gas in each flare is subject to H2S limit of Subpart J. The flares are applicable to the operating requirements of 40 CFR 60.18, 40 CFR 63.11, and 40 CFR 63.643. The flares are required to be operated at all times when gases are vented to it. The facility is to investigate the cause of Hydrocarbon flaring, Acid Gas Flaring, and Tail Gas incidents. The facility is required to submit and operate the flares in compliance with the Alternative Monitoring Plan for the flares. The AMP is attached in Section F of the operating permit. The facility is to submit reports of each Hydrocarbon flaring, Acid Gas Flaring, and Tail Gas incidents.

LOADING FACILITIES AND CONTROL EQUIPMENT:

The propane loading station and flare have a rolling 12-month VOC limit and operating requirements from permit conditions. Most VOC emissions from the station are from fugitives, with loading emissions less than 1 ton. Since the potential VOC emissions from fugitives are less than 20 tons, the facility will always be in compliance with this requirement. Monitoring for the requirement is a leak detection and repair program. The benzene railcar unloading station must have a carbon adsorber that limits outlet benzene emissions to below 20 ppmv as per plan approval conditions. All loading facilities must have a leak detection and repair program (LDAR) as per 25 Pa Code §129.58.

SULFUR RECOVERY UNITS:

The sulfur recovery units have emissions limits from NSPS Subpart J, the SO2 permit, and 25 Pa Code §129.13. The limits of the SO2 permit are more stringent than 25 Pa Code §129.13, which has been streamlined. The units have SO2 CEMs. The SRU are limited to a combined sulfur production rate of 80 long tons per day.

The following is a side-by-side comparison of the streamlined limits of Section D.6.(a)(2):

Units P659 and P660 @ 100 tons S/day – SO2 Operating Permit - SO2 shall not exceed 31.72 lb/hr.

25 Pa Code 129.13 – SO₂ shall not exceed $.32 \times (100)^{-.5} = 0.032$ = pounds of SO₂/lb S (100 tons S/day = 100 tons * (2000 lbs/ 1 ton) * (1 day/24 hr) = 8333 lbs S/hr,
0.032 pounds SO₂/(lb S / 8333 lb S/hr) = **266.6 lb SO₂/hr**

Since 31.72 lb/hr is more stringent than 266.6 lb/hr, 31.72 is written in the permit and 266.6 is subsumed.

REFINERY VOC, SOCMI VOC, & EXISTING REFINERY MACT, NSPS, OR NESHAP HAP COMPONENTS SUBJECT TO 40 CFR 60 SUBPART VV:

Parts of the facility are applicable to the following LDAR requirements: NSPS Subparts VV and GGG, MACT Subparts CC and H, NESHAPS Subpart J, 25 Pa Code §129.58, and 25 Pa Code §129.71. For overlapping regulations, most are only required to comply with NSPS Subpart VV, the most stringent. The benzene recovery and cumene production units have additional requirements from MACT Subpart H. AMS has approved the more restrictive MACT Subpart CC and H programs as an alternative leak check for 25 Pa Code 129.71(d) and 25 Pa Code 129.58(g).

40 CFR 63 Subpart CC – National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries - 40 CFR 63.640(c) states that the affected source shall comprise all emissions points, in combination listed here that are located at a single refinery plant site:

- All miscellaneous process vents from petroleum refining process units [40 CFR 63.640(c)(1)]
- All storage vessels associated with petroleum refining process units [40 CFR 63.640(c)(2)]
- All wastewater streams and treatment operations associated with petroleum refining process units [40 CFR 63.640(c)(3)]
- All equipment leaks from petroleum refining process units [40 CFR 63.640(c)(4)]
- All gasoline loading racks classified under Standard Industrial Classification Code 2911 [40 CFR 63.640(c)(5)]
- All marine vessel loading operations located at a petroleum refinery meeting the applicability of 40 CFR 63 Subpart Y - 40 CFR 63.560 [40 CFR 63.640(c)(6)]
- All storage vessels and equipment leaks associated with a bulk gasoline terminal or pipeline breakout station classified under Standard Industrial Classification Code 2911 located within a contiguous area and under common control with a refinery [40 CFR 63.640(c)(7)]
that meet the following:
- Are located at a plant site that is a major source as defined in section 112(a) of the Clean Air Act [40 CFR 63.640(a)(1)] and
- Emit or have equipment containing or contacting one or more of the hazardous air pollutants listed below from table 1 of 40 CFR 63 subpart CC : [40 CFR 63.640(a)(2)]

Dibromoethane (1,2) ethylene dibromide
Dichloroethane (1,2)
Diethanolamine
Ethylbenzene
Ethylene glycol
Hexane
Methanol
Methyl ethyl ketone (2-butanone)
Methyl isobutyl ketone (hexone)
Methyl tert butyl ether
Naphthalene
Phenol
Toluene
Trimethylpentane (2,2,4)
Xylene (mixed isomers)
Xylene (m-)
Xylene (o-)
Xylene (p-)

40 CFR 63.648(a) states that the Permittee of an existing source subject to the provisions of 40 CFR 63 Subpart CC shall comply with the provisions of 40 CFR 60 subpart VV and apply only to equipment in organic HAP service meaning any of the organic chemicals from table 1 of 40 CFR 63 subpart CC. [40 CFR 63.648(a)(1)]

The Permittee of a new source subject to the provisions of 40 CFR 63 Subpart CC shall comply with subpart H of 40 CFR 63. New sources shall be those source constructed or reconstructed after July 14, 1994 as per 40 CFR 63.640(h)(1).

40 CFR 60 Subpart VV – Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry (SOCMI) as per 40 CFR 60.480(a)(1) applies to affected facilities in SOCMI and as per 40 CFR 60.480(a)(2) applies to the group of all equipment (defined in 40 CFR 60.481) within a process unit is an affected facility.

40 CFR 60 Subpart GGG – Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries - As per 40 CFR 60.590(d) –facilities subject to subpart VV or subpart KKK of 40 CFR 60 are excluded from this subpart which includes: affected facilities in petroleum refineries [40 CFR 60.590(a)(1)], a compressor [40 CFR 60.590(a)(2)], and the group of all the equipment defined in 40 CFR 60.591 within a process unit [40 CFR 60.590(a)(3)]

SOCMI OR REFINERY NESHAP COMPONENTS, AND CERTAIN VOC COMPONENTS, SUBJECT TO 40 CFR 63 SUBPART H:

40 CFR 63 Subpart H – National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks - 40 CFR 63.160(a) states that this subpart applies to pumps, compressors, agitators, pressure relief devices, sampling connection systems, open-ended valves, connectors, surge control vessels, bottoms receivers, instrumentation systems, and control devices or closed vent systems that are intended to operate in organic hazardous air pollutant service 300 hours or more during the calendar year within a source subject to the provisions of a specific subpart of 40 CFR 63 that reference this subpart. As per 40 CFR 63.160(b) – after the compliance date for a process unit, equipment to which this subpart applies that are also subject to 40 CFR 60 and 61 will be required to comply only with the provisions of this subpart. As per 40 CFR 63.160(c), if a process unit has equipment subject to 40 CFR 60 subpart VV, GGG, or KKK or 40 CFR 61 subpart F or J, to which 40 CFR 63 subpart H does not apply, the Permittee may elect to apply this subpart to all such equipment in the process unit. All VOC shall be considered HAP and shall be deemed to constitute compliance with 40 CFR 60 subpart VV, GGG, or KKK or 40 CFR 61 subpart F or J. In addition, 40 CFR 63.100 (Subpart F which provides applicability provisions, definitions, and other general provisions that are applicable to subparts G (process) and H (equipment leaks) of 40 CFR 63 as per 40 CFR 63.100(a)). Subpart H only applies to petrochemical process equipment leaks.

EQUIPMENT VOC LEAK COMPONENTS NOT SUBJECT TO NSPS OR NESHAP:

25 Pa Code 129.58 – Petroleum refineries – fugitive sources. As per 25 Pa Code 129.58(g) – The Permittee of a petroleum refinery may submit an alternative plan for the control of leaks from petroleum refinery equipment to AMS. If AMS finds that the alternative plan will achieve an emission reduction which is equivalent to or greater than the reduction which can be achieved under this section, then AMS will allow the implementation of the alternative plan.

25 Pa Code 129.71 – Synthetic Organic Chemical and PolymerManufacturing – fugitive sources. This section applies to a facility with design capability to manufacture 1000 tons per year or more of a SOC listed in 40 CFR 60.489. [25 Pa Code 129.71(a)(1)] As per 25 Pa Code 129.71(d) – The Permittee may submit an alternative plan for the control of leaks from components. If AMS finds that the alternative plan will achieve an emission reduction which is equivalent to or greater than the reduction which can be achieved under this section, then AMS will allow the implementation of the alternative plan.

AMR V. Sec. XIII.E states that: The Permittee subject to AMR V. Sec. XIII.B. may propose an alternative program for the control of VOC leaks. If AMS finds that the alternative program will provide VOC emission control equivalent to or greater than that which can be achieved under AMR V. Sec. XIII.B., and the alternative plan is enforceable, then AMS may approve the implementation of the alternative plan. Therefore, the alternative plan is more stringent than the state, NSPS, NESHAP, or MACT program and a unit is applicable to the more stringent regulation as per the table in D.7. – Group 06.

The Permittee is required to comply with AMR V. Sec. XIII that prohibits the emissions of VOC in a liquid state at the point(s) of discharge into the atmosphere as per AMS Letter dated May 30, 2000 and AMR V. Sec. XIII.A.2.

COOLING TOWERS:

The cooling towers are prohibited from using chromium-based water treatment chemicals as per MACT Subpart Q. They have an inspection and maintenance/monitoring program requirement from the RACT Plan Approval. One cooling tower has cooling water monitoring requirements from MACT Subpart F.

MISCELLANEOUS PROCESS VENTS (GROUP 1) SUBJECT TO 40 CFR 63 SUBPARTS G AND CC:

The facility has some MACT Subpart G or CC miscellaneous process vents that must vent to a heater of greater than 44 MW or a flare to reduce organic HAP emissions to specified levels.

TANKS:

The facility has storage tanks applicable to the following requirements: MACT Subparts G and CC, NSPS Subpart Kb, 25 Pa Code §129.56, and AMR V. Tanks comply with these requirements with either internal or external floating roofs in addition to other requirements. Many tanks are applicable to multiple regulations. For these tanks, the most stringent requirements are listed and the rest are streamlined.

Group 13A – Tanks subject to 40 CFR 63 Subpart G – applicable to storage vessels subject to subpart F of 40 CFR 63. As per 40 CFR 63.110(b)(1) – A storage vessel that is also subject to the provisions of 40 CFR 60 subpart Kb is required to comply only with the provisions of 40 CFR 63 Subpart G. As per 40 CFR 63.110(b)(2) – A storage vessel that is also subject to the provisions of 40 CFR 61 subpart Y is required to comply only with the provisions of 40 CFR 63 Subpart G. This streamlined permit condition assures compliance with 25 Pa Code 129.56 and AMR V. Sec. II. and 40 CFR 63.110(b)(1) for P-005. – states that if applicable to 40 CFR 60 Kb, may assure compliance with 40 CFR 63 Subpart G.

Most Stringent Requirements as follows in permit:

Girard Point Tanks – Refer to Group 14C.

40 CFR 60.112b(a)(2) - An external floating roof means a pontoon-type or double-deck type cover that rests on the liquid surface in a vessel with no fixed roof. Each external floating roof must meet the following specifications:

B.2 - Each external floating roof shall be equipped with a closure device between the wall of the storage vessel and the roof edge. The closure device is to consist of two seals, one above the other. The lower seal is referred to as the primary seal, and the upper seal is referred to as the secondary seal. [40 CFR 60.112b(a)(2)(i)]

The primary seal shall be either a mechanical shoe seal or a liquid-mounted seal. Except as provided in 40 CFR 60.113b(b)(4), the seal shall completely cover the annular space between the edge of the floating roof and tank wall. [40 CFR 60.112b(a)(2)(i)(A)]

The secondary seal shall completely cover the annular space between the external floating roof and the wall of the storage vessel in a continuous fashion except as allowed in 40 CFR 60.113b(b)(4). [40 CFR 60.112b(a)(2)(i)(B)] Except for automatic bleeder vents and rim space vents, each opening in a noncontact external floating roof shall provide a projection below the liquid surface. Except for automatic bleeder vents, rim space vents, roof drains, and leg sleeves, each opening in the roof is to be equipped with a gasketed cover, seal, or lid that is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. Automatic bleeder vents are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports. Rim vents are to be set to open when the roof is being floated off the roof legs supports or at the manufacturer's recommended setting. Automatic bleeder vents and rim space vents are to be gasketed. Each emergency roof drain is to be provided with a slotted membrane fabric cover that covers at least 90 percent of the area of the opening. [40 CFR 60.112b(a)(2)(ii)]

The roof shall be floating on the liquid at all times (i.e., off the roof leg supports) except during initial fill until the roof is lifted off leg supports and when the tank is completely emptied and subsequently refilled. The process of filling, emptying, or refilling when the roof is resting on the leg supports shall be continuous and shall be accomplished as rapidly as possible. [40 CFR 60.112b(a)(2)(iii)]

Point Breeze Tank – Refer to Group 13C.

B.1 - The internal floating roof shall rest or float on the liquid surface (but not necessarily in complete contact with it) inside a storage vessel that has a fixed roof. The internal floating roof shall be floating on the liquid surface at all times, except during initial fill and during those intervals when the storage vessel is completely emptied or subsequently emptied and refilled. When the roof is resting on the leg supports, the process of filling, emptying, or refilling shall be continuous and shall be accomplished as rapidly as possible. [40 CFR 60.112b(a)(1)(i)]

Each internal floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the internal floating roof: [40 CFR 60.112b(a)(1)(ii)]

(i) A foam-or liquid-filled seal mounted in contact with the liquid (liquid-mounted seal). A liquid-mounted seal means a foam-or liquid-filled seal mounted in contact with the liquid between the wall of the storage vessel and the floating roof continuously around the circumference of the tank. [40 CFR 60.112b(a)(1)(ii)(A)]

(ii) Two seals mounted one above the other so that each forms a continuous closure that completely covers the space between the wall of the storage vessel and the edge of the internal floating roof. The lower seal may be vapor-mounted, but both must be continuous. [40 CFR 60.112b(a)(1)(ii)(B)]

(iii) A mechanical shoe seal. A mechanical shoe seal is a metal sheet held vertically against the wall of the storage vessel by springs or weighted levers and is connected by braces to the floating roof. A flexible coated fabric (envelope) spans the annular space between the metal sheet and the floating roof. [40 CFR 60.112b(a)(1)(ii)(C)] Each opening in a noncontact internal floating roof except for automatic bleeder vents (vacuum breaker vents) and the rim space vents is to provide a projection below the liquid surface. [40 CFR 60.112b(a)(1)(iii)]

Each opening in the internal floating roof except for leg sleeves, automatic bleeder vents, rim space vents, column wells, ladder wells, sample wells, and stub drains is to be equipped with a cover or lid which is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. The cover or lid shall be equipped with a gasket. Covers on each access hatch and automatic gauge float well shall be bolted except when they are in use. [40 CFR 60.112b(a)(1)(iv)]

Automatic bleeder vents shall be equipped with a gasket and are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports. [40 CFR 60.112b(a)(1)(v)]

Rim space vents shall be equipped with a gasket and are to be set to open only when the internal floating roof is not floating or at the manufacturer's recommended setting. [40 CFR 60.112b(a)(1)(vi)]

Each penetration of the internal floating roof for the purpose of sampling shall be a sample well. The sample well shall have a slit fabric cover that covers at least 90 percent of the opening. [40 CFR 60.112b(a)(1)(vii)]

Each penetration of the internal floating roof that allows for passage of a column supporting the fixed roof shall have a flexible fabric sleeve seal or a gasketed sliding cover. [40 CFR 60.112b(a)(1)(viii)]

Each penetration of the internal floating roof that allows for passage of a ladder shall have a gasketed sliding cover. [40 CFR 60.112b(a)(1)(ix)]

Streamlined Requirements:

A1. - 25 Pa Code 129.56 –For Storage Tanks > 40,000 gallons shall either have an external or internal floating roof - 25 Pa Code 129.56(a)(1) or a vapor recovery system - 25 Pa Code 129.56(a)(2)

Girard Point Tanks – Refer to Group 14C. – Streamlined state Requirements

A2. - An external floating roof must be fitted with a primary seal and a continuous secondary seal extending from the floating roof to the tank wall (rim-mounted secondary seal). The external floating roof shall meet the following equipment requirements:

129.56(b)(1)

(1) Seal closure devices must meet the following requirements:

129.56(b)(1)(i)

(i) There are no visible holes, tears, or other openings in the seals or seal fabric.

129.56(b)(1)(ii)

(ii) The seals are intact and uniformly in place around the circumference of the floating roof between the floating roof and the tank wall.

129.56(b)(2)

(2) Openings in the external floating roof, except for automatic bleeder vents, rim space vents, and leg sleeves, are as follows:

129.56(b)(2)(i)

(i) Equipped with covers, seals, or lids in the closed position except when the openings are in actual use.

129.56(b)(2)(ii)

(ii) Equipped with projections into the tank which remain below the liquid surface at all times.

129.56(b)(3)

(3) Automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports.

129.56(b)(4)

(4) Rim vents are set to open when the roof is being floated off the leg supports or at the recommended setting of the manufacturer.

Point Breeze Tank – Refer to Group 13C. - Streamlined state Requirements

A3. - An internal floating roof must be fitted with a primary seal and must comply with the following equipment requirements:

129.56(c)(1)

- (1) A closure seal, or seals, to close the space between the roof edge and tank wall is used.
129.56(c)(2)
(2) There are no holes, tears, or other openings in the seal or any seal fabric or materials.
129.56(c)(3)
(3) Openings except stub drains are equipped with covers, lids or seals such that:
129.56(c)(3)(i)
(i) The cover, lid or seal is in the closed position at all times except when in actual use;
129.56(c)(3)(ii)
(ii) Automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports.
129.56(c)(3)(iii)
(iii) Rim vents, if provided are set to open when the roof is being floated off the roof leg supports or at the recommended setting of the manufacturer.

A4. - Streamlined City Requirements - AMR V. SEC II. STORAGE TANKS

No person shall place or store in any stationary storage tank or container of 40,000 gallon capacity or greater, any organic material having a vapor pressure of 1.5 pounds per square inch absolute or greater at actual storage conditions unless one of the following organic material vapor control devices properly installed and well maintained is in operation:

1. A floating roof resting on the surface of the liquid contents equipped with a closure seal, or seals, to close the space between the roof edge and tank wall, and in addition, all tank gauging and sampling devices shall be gas tight except when in use, or
2. A pressure tank system maintaining a pressure at all times so as to prevent organic material loss to the atmosphere, or
3. A vapor recovery system capable of collecting the organic materials emitted from the tank and disposing of these emissions so as to prevent their emission to the atmosphere, and in addition, all tank gauging and sampling devices shall be gas-tight except when is use, or
4. Other equipment equal or greater in efficiency to those devices listed above, and approved by the Department.

No person shall place, or store in any stationary storage tank or container of 40,000 gallon capacity or greater, any organic material having a vapor pressure of 11.0 pounds per square inch absolute or greater at actual storage conditions unless one of the following organic material vapor control devices properly installed and well maintained, is in operation:

1. A pressure tank system maintaining a pressure at all times so as to prevent organic material loss to the atmosphere, or
2. A vapor recovery system capable of collecting the organic materials emitted from the tank and disposing of these emissions so as to prevent their emission to the atmosphere, and in addition, all tank gauging and sampling devices shall be gas-tight except when in use, or
3. Other equipment equal or greater in efficiency to those devices listed above, and approved by the Department.

Group 13B – Floating Roof Tanks subject to 40 CFR 63 Subpart CC – applicable to All storage vessels associated with petroleum refining process units [40 CFR 63.640(c)(2)] that meet the following:

- Are located at a plant site that is a major source as defined in section 112(a) of the Clean Air Act [40 CFR 63.640(a)(1)] and
- Emit or have equipment containing or contacting one or more of the hazardous air pollutants listed from table 1 of 40 CFR 63 subpart CC : [40 CFR 63.640(a)(2)]

Same requirements as 40 CFR 60 Subpart Kb as Group 13C described above in B.1.

(i) The following paragraphs do not apply to storage vessels at existing sources subject to subpart CC of 40 CFR 63: 40 CFR 63.119(b)(5), 40 CFR 63.119(b)(6), 40 CFR 63.119(c)(2), and 40 CFR 63.119(d)(2) (gasketed fittings). [40 CFR 63.646(c)]

(ii) When complying with the inspection requirements of 40 CFR 63.120 of subpart G of 40 CFR 63, the Permittee of storage vessels at existing sources are not required to comply with the provisions for gaskets, slotted membranes, and sleeve seals. [40 CFR 63.646(e)]

(iii) If a cover or lid is installed on an opening on a floating roof, the cover or lid shall remain closed except when the cover or lid must be open for access. [40 CFR 63.646(f)(1)]

(iv) Rim space vents are to be set to open only when the floating roof is not floating or when the pressure beneath the rim seal exceeds the manufacturer's recommended setting. [40 CFR 63.646(f)(2)]

(v) Automatic bleeder vents are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports. [40 CFR 63.646(f)(3)]

Streamlined requirements as per #A1, A2, A3, and A4 above.

Group 13C – Floating Roof Tanks subject to 40 CFR 60 Subpart Kb – applicable to petroleum liquid storage vessels after 7/23/84 greater than 40 cubic meters described above in B.1.

Streamlined requirements as per #A1, A2, A3, and A4 above.

Group 14A – External Roof Tanks subject to 25 Pa Code 129.56 - applicable to tanks with a capacity of 40,000 gallons or greater. These tanks were installed before 1960 and are not applicable to NSPS. They only store crude oil and are not applicable to a MACT as well.

As per A.1 and A.2 above. Streamlined is A.4 above – city requirements

Group 14B – External Roof Tanks subject to 40 CFR 63 Subpart CC – applicable to All storage vessels associated with petroleum refining process units [40 CFR 63.640(c)(2)] that meet the following:

- Are located at a plant site that is a major source as defined in section 112(a) of the Clean Air Act [40 CFR 63.640(a)(1)] and

Emit or have equipment containing or contacting one or more of the hazardous air pollutants listed from table 1 of 40 CFR 63 subpart CC : [40 CFR 63.640(a)(2)]

Same requirements as 14C as per B.2. above.

Streamlined requirements as per #A1, A2, A3, and A4 above.

Group 14C – External Roof Tanks subject to 40 CFR 60 Subpart Kb – applicable to petroleum liquid storage vessels after 7/23/84 greater than 40 cubic meters. Same requirements as per B.2. above.

Streamlined requirements as per #A1, A2, A3, and A4 above.

Group 15A – Group 2 Tanks subject to 40 CFR 63 Subpart G – applicable to storage vessels subject to subpart F of 40 CFR 63. As per 40 CFR 63.110(b)(3) – A Group 2 storage vessel that is also subject to the provisions of 40 CFR 61 subpart Y, the recordkeeping and reporting of 40 CFR 61 subpart Y is accepted as compliance with 40 CFR 63 Subpart G.

These streamlined permit conditions assure compliance with 25 Pa Code 129.56 and AMR V. Sec. II. as per #A1, A2, A3, and A4 above for all tanks except for P-148, P-149, P-154, P-175, P-176, P-177, P-178, and P-179. Tanks P-148, P-149, P-154, P-175, P-176, P-177, P-178, and P-179 are all under 2000 gallons and are not applicable to a tank regulation except P-154 which is greater than 2000 gallons, but less than 40,000 gallons. These streamlined permit conditions assure compliance with 25 Pa Code 129.57 for Tank P-154.

Streamlined 25 Pa Code 129.57 for Tank P-154 - The provisions of this section shall apply to above ground stationary storage tanks with a capacity equal to or greater than 2,000 gallons which contain volatile organic compounds with vapor pressure greater than 1.5 psia (10.5 kilopascals) under actual storage conditions. Storage tanks covered under this section shall have pressure relief valves which are maintained in good operating condition and which are set to release at no less than .7 psig (4.8 kilopascals) of pressure or .3 psig (2.1 kilopascals) of vacuum or the highest possible pressure and vacuum in accordance with state or local fire codes or the National Fire Prevention Association guidelines or other national consensus standards acceptable to the Department. Section 129.56(g) (relating to storage tanks greater than 40,000 gallons capacity containing volatile organic compounds) applies to this section. Petroleum liquid storage vessels which are used to store produced crude oil and condensate prior to lease custody transfer shall be exempt from the requirements of this section.

Group 15B – Fixed Roof Tanks subject to 40 CFR 60 Subpart Kb – applicable to petroleum liquid storage vessels after 7/23/84 greater than 40 cubic meters. Same requirements as 14C as per B.2. above.

MARINE LOADING EQUIPMENT:

The marine vapor collection and control system (MVCACS) for marine loading is applicable to the LDAR requirements of MACT Subpart H. It also has permit approval conditions with a control efficiency requirement. The facility is not applicable to the ballasting requirements of 25 Pa Code §129.81(4) because the Girard Point Wharf does not receive crude oil or gasoline cargoes. The facility is applicable to 40 CFR 63.560(a)(3) – which applies to existing sources with emissions less than 10 and 25 tons. Only the recordkeeping requirements of 40 CFR 63.567(j)(4) and the emission estimation requirements of 40 CFR 63.565(l) apply. Per 40 CFR 63.567(b), if the sources become affected per 40 CFR 63 Subpart Y, they will have to notify EPA and AMS.

FLUIDIZED CATALYTIC CRACKING UNITS:

One Fluidized Catalytic Cracking Unit (FCCU) has particulate, SO₂, CO, NO_x, and hydrocarbon (HC) emission limits from plan approval conditions. This permit consolidates requirements from case-by-case RACT, NSPS Subpart J, and the SO₂ permit. The FCCU also has plan approval conditions limiting the throughput rate and requiring CEMs for NO_x, SO₂, CO, and opacity. There is also a good combustion practices requirement from case-by-case RACT. The other FCCU vents emissions to a CO Boiler. It has a feed rate limit from a permit approval letter. The CO Boiler has an SO₂ emission limit from the SO₂ permit. CO emissions are monitored by a CO CEM. When the CO Boiler is not in operation, the FCCU must be operated with a CO promoter in order to maintain compliance with the CO emission limits of AMR VIII.

The following is a side-by-side comparison of the streamlined limits of Section D.21.(a)(1):

Pollutants	Concentration	Emission Limitation		
		Lbs/hr	Lbs/day	Tons/yr
Particulate	1 lb/1000 lb coke	25	600	95
SO ₂	500 ppmv	358	8,600	1,355
CO	500 ppmv	54	1,300	237
NO _x	None	221	5,304	482
HC	N/A	17	405	74

This table comes right out of Plan Approval 00102 dated 8/28/00.

RACT has a tons/yr NO_x limit in Section 2H of 569 tons/yr. Since Plan Approval 00102 dated 8/28/00 limit of 482 tons/yr is more stringent than 569, the RACT permit has been subsumed.

SO₂ Operating Permit has the same 358 lbs/hr limit as Plan Approval 00102 dated 8/28/00.

AMS Approval letter dated 11/22/99 has a 6960 lbs/day limit for NO_x and a 569 tons/yr limit for NO_x. Since Plan Approval 00102 dated 8/28/00 limit of 5304 and 482 respectively are more stringent than 6960 lb/day and 569 ton/yr, the AMS Approval letter dated 11/22/99 has been subsumed.

NSPS Subpart J has a 1.0 lb/1000 lb coke PM Particulate limit from 40 CFR 60.102(a)(1) and a 500 ppmv CO limit from 40 CFR 60.103(a). These are the same limits as Plan Approval 00102 dated 8/28/00. The Facility is not applicable to the SO₂ limits from NSPS Subpart J based on the modification to the unit.

INTER-REFINERY PIPELINE EQUIPMENT:

The Inter-Refinery Pipeline Project is applicable to the LDAR requirements of NSPS Subpart GGG, which follows the requirements of NSPS Subpart VV. The project has a VOC emission limit of 12 tons per rolling 12-month period from an installation permit and permit approval letter. All VOC emissions from this project are fugitives. Potential emissions based on the 1995 EPA screening correlations are 0.04 tons per year. As a result, compliance with the emission limit is assured by maintaining the LDAR program.

ALKYLATION:

The alkylation units have flares as control devices (one for the Girard Point unit, two for the Point Breeze unit). One of the alkylation units has plan approval conditions limiting throughput and requiring SHU catalyst treatment gas to be routed to a flare that conforms with HAP control requirements under 40 CFR 63.11(b).

Unit P662 has some requirements for individual drain systems, sewer lines, and access doors and other openings stemming from NSPS Subpart QQQ. This group is not applicable to the oil-water separator requirements of 40 CFR 60.693-2 because this group does not have an independent oil-water separator with a floating roof. This unit sewer system drains to the refinery oily water system which complies with 40 CFR 61 Subpart FF.

40 CFR 60.693-2(b) and (c). These permit condition assure compliance with 25 Pa Code 129.55(a)(1) and (2)

The Permittee must notify the EPA Administrator and AMS in the report required by 40 CFR 60.7 that they have elected to construct and operate a floating roof as per 40 CFR 60.693-2(b). This permit condition assures compliance with 25 Pa Code 129.55(a)(2) which states a container equipped with a floating roof will rest on the surface of the contents and be equipped with a closure seal or seals to close the space between the roof edge and container wall. Gauging and sampling devices shall be gas-tight.

For portions of the oil-water separator tank where it is infeasible to construct and operate a floating roof, such as the skimmer mechanism and weirs, a fixed roof meeting the requirements of 40 CFR 60.692-3(a) shall be installed as per 40 CFR 60.693-2(c). This permit condition assures compliance with 25 Pa Code 129.55(a)(1) which states that a container having openings sealed and totally enclosing the liquid contents.

HYDROGEN PURIFICATION EQUIPMENT:

Hydrogen purification unit equipment is applicable to NSPS Subpart GGG, 25 Pa Code §129.55, and 25 Pa Code §129.58. Components must meet the same LDAR requirements as NSPS Subpart VV.

DEGREASING VATS:

The degreasing vats are applicable to 25 Pa Code §129.63. They are limited from using halogenated solvents that would make them applicable to MACT Subpart T. The vats typically use #2 furnace oil as a solvent and have calculated emissions less than 100 lbs/yr, so regular solvent usage records are not required. Only records of the type and amount of solvent added to the vats that meets the definition of light liquid is required.

BUTANE ISOMERIZATION:

The butane isomerization unit must introduce the vent stream into the flame zone of a boiler or process, as per 40 CFR 60.662(a) (NSPS Subpart NNN).

REFINING WASTEWATER and SOCMI WASTEWATER:

The facility has refining wastewater that is applicable to NESHAPS Subpart FF. HAP wastewater streams associated with SOCMI process units (benzene and cumene production units, tank truck loading, and railcar unloading) is applicable to MACT Subpart F.

In accordance with 40 CFR 63.138(g) – Process wastewater provisions – performance standards for treatment processes managing Group 1 wastewater streams and/or residuals removed from Group 1 wastewater streams, the

Permittee of a new or existing source using biological treatment for at least one wastewater stream that is Group 1 for Table 9 compounds shall achieve a required mass removal of at least 95 percent for all Table 9 compounds. The Permittee of a new source using biological treatment for at least one wastewater stream that is Group 1 for Table 8 compounds shall achieve a required mass removal of at least 95 percent for all Table 8 compounds. All Group 1 and Group 2 wastewater streams entering a biological treatment unit that are from chemical manufacturing process units subject to 40 CFR 63 Subpart F shall be included in the demonstration of the 95-percent mass removal.

This section specifies the performance standards for treating Group 1 wastewater streams. Where multiple compliance options are provided, the options may be used in combination for different wastewater streams and/or for different compounds (e.g., Table 8 versus Table 9 compounds) in the same wastewater streams. Once a Group 1 wastewater stream or residual removed from a Group 1 wastewater stream has been treated in accordance with 40 CFR 63 Subpart F, it is no longer subject to the requirements of 40 CFR 63 Subpart F as per 40 CFR 63.138(a).

Definition of an existing source. If the wastewater stream, at an existing source, is Group 1 for Table 9 compounds, comply with 40 CFR 63.138(b) which states to comply with 40 CFR 63.138(b)(1) or (b)(2) 40 CFR 63.138(b)(2) states to comply with paragraphs (d), (e), (f), (g), (h), or (i) of 40 CFR 63.138. In this case (g) is chosen . [40 CFR 63.138(a)(1)]

Definition of a New source. If the wastewater stream, at a new source, is Group 1 for Table 8 compounds, comply with 40 CFR 63.138(c) which states to comply with 40 CFR 63.138(c)(1) or (c)(2) 40 CFR 63.138(c)(2) states to comply with paragraphs (d), (e), (f), (g), (h), or (i) of 40 CFR 63.138. In this case (g) is chosen . If the wastewater stream, at a new source, is Group 1 for Table 9 compounds, comply with 40 CFR 63.138(b). If the wastewater stream, at a new source, is Group 1 for Table 8 and Table 9 compounds, comply with both 40 CFR 63.138(b) and 40 CFR 63.138(c). [40 CFR 63.138(a)(2)]

The requirements for Table 8 and/or Table 9 compounds are similar and often identical.

A portable type of carbon adsorption as carbon canisters is the control device to meet the 95-percent RMR option, for biological treatment processes. SOCMU units 1732 (Benzene) and 1733 (Cumene) are the plant areas where carbon canisters are employed. They are a portable type of carbon adsorption for certain sewer sump and drain vents.

BENZENE AND CUMENE PRODUCTION:

The facility has cumene loading to trucks and barges, and Cumene is Group 2. The facility does unload benzene from RR cars under permit (Group 04), but it is an unregulated activity under the HON, (only "loading" has requirements).

The benzene production unit has a plan approval condition limiting the average daily steam use. The cumene production unit has production rate limits from plan approval conditions. Fugitive leak sources, wastewater streams, and Group 1 process vents for these units are applicable to the requirements listed for these groups in the permit.

EMERGENCY GENERATORS AND FIRE?MITIGATION PUMPS:

Each unit is subject to Plan Approval exemption limits. The units are also subject to AMR VII for CO and 25 Pa Code §123.13(c)(1)(i) for PM. The units are subject to MACT ZZZZ as it applies to emergency IC engines. In addition the units are subject to ozone season regulation of AMR XV.

INTERNAL COMBUSTION UNITS:

Each unit is subject to Plan Approval exemption limits. The units are also subject to AMR VII for CO and 25 Pa Code §123.13(c)(1)(i) for PM. The units are subject to MACT ZZZZ as it applies to emergency IC engines.

The facility uses rental air compressors and pumps. AMS has approved the use of rental units as long as each unit meet the appropriate Tier level and capacity levels. In addition the units are also subject to hours restrictions as stated in the permit.

SUNOCO MARCUS HOOK REFINERY

The air contaminant sources located in Sunoco's Marcus Hook refineries which are permitted under Title V operating permit No. 23-00001 and the air contaminant sources located in Sunoco's Philadelphia refinery which are

permitted under Title V operating Permit N0. V95-038 shall be considered as a single facility for New Source Review (NSR), Prevention of Significant Deterioration (PSD) and Title V applicability purposes

Sunoco Marcus Hook Refinery Title V Operating Permit No. 23-0001 is incorporated by reference into this operating permit.

BUSINESS RELATIONSHIP with Transflo

The receiving refinery historically was owned and operated by Sunoco, Inc. however it is currently operated as a joint venture named Philadelphia Energy Solutions(PES). PES is a joint venture between Sunoco and the Carlye Group, a Washington D.C. private equity manager. PES refinery is currently not a customer of TRANSFLO, although at the conclusion of the Plan Approval and Installation Permit projects involved with this Synthetic Minor Operating Permit, they are expecting to become a TRANSFLO customer.

TRANSFLO operated the Philadelphia terminal in 1985. The terminal operation expanded in 1987. The facility has remained in continuing operation since opening. TRANSFLO currently loads a variety of solid and liquid material products for a variety of customers. TRANSFLO and PES are adjacent properties, However, The two facilities do not share Workforces, equipment. Pollution control equipment. By the nature of transloading operation, TRANSFLO is providing one of the raw materials for the PES Refinery. If the PES refinery were to shut down, TRANSFLO would continue operating as it currently does and has for 27 years. Although TRANSFLO welcomes the transloading services, it is not dependent on these services for their continued operation.

Therefore the two facility are considered separate individual facilities with individual permits.